DECS-100 Digital Excitation Control System

Basler Electric offers a high powered, low-cost digital excitation control system, the DECS-100. This environmentally rugged product is ideally suited for controlling the output of brushless excited synchronous generators up to 5MW. The DECS-100 has a very impressive 7Adc output from a pulse width modulated power stage. The DECS-100 is perfect for machines that will be paralleled to other generators and/or to the utility system. It is ideal for distributed generation, co-generation and peak shaving applications. The DECS-100 is easy to use, and it has communications capability with a PC or a personal data assistant running Palm OS® 3.3 or newer software. The DECS-100 utilizes microprocssor technology and control algorithms pioneered by Basler Electric over the last 12 years. It shares many features and functions of our larger excitation control systems. The DECS-100 is Basler Electric's fifth generation of microprocessor-based excitation system.

FEATURES

- Microprocessor based
- 0.25% Voltage Regulation Accuracy
- 0.5% accuracy up to 40% THD (harmonics associated with 6 SCR load)
- 63Vdc @ 7Adc PWM output
- 0-3X V/Hz limiting
- Soft Start capability
- 20 standard stability selections and one customizable selection
- VAR/PF control
- Overexcitation limiting
- Voltage Matching
- Manual Mode (Field current regulation)
- Paralleling input from 1 or 5A CT secondaries
- Nominal sensing inputs of 120, 240, 480 and 600Vac
- Power Input from 50/60Hz shunt connections or PMGs operating at 50 to 400Hz
- Five generator protection functions including Loss of Sensing transfer to manual
- Alarm Contact Output
- Accessory input
- LED Annunciation of operating conditions
- Setup via PC or a PDA using Palm OS® 3.3 or newer via BESTCOMS software (included)
- UL recognized
- CSA approved
- CE compliant

WINDOWS® SOFTWARE

Interface for setting and communicating with Basler products

Request BESTCOMS™-DECS100-32
(Windows® NT 3.51 or later, 95, 98, or Me)

ADDITIONAL INFORMATION

INSTRUCTION MANUAL

Request Publication 9287500991

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Pages 2 and 3

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Basler Electric

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DESCRIPTION

The DECS-100 is a microprocessor-based regulation system designed to control the output of a brushless excited synchronous generator. The DECS-100 is perfect for paralleling applications where generator to generator and/or generator to utility paralleling occurs with VAR/PF control and Overexcitation Limiting. The DECS-100 offers high functionality, communications, and performance at an extremely affordable price. The DECS-100 is very rugged and offers an extremely robust mechanical design that is UL recognized, CSA approved, and CE compliant.

SPECIFICATIONS

INPUTS

Power Input

Voltage:	88-250Vac
Phase:	Single- or three-phase
Burden:	650VA
Frequency:	50 to 400Hz
Minimum Build-up Voltage:	6.0Vac

Sensing Input

Nominal Voltage Input:	100/120, 200/240, 400/480, 600Vac, Single- or three-phase
Burden:	<1VA
Current Input:	1 or 5 Amp (two models)
Burden:	<1 VA
Frequency:	50/60Hz

Accessory Input

±1Vdc creates a ±10% adjustment for AVR, FCR and VAR
±1Vdc creates a ±0.1PF adjustment in the PF mode
(adjusts only the active regulation mode)

OUTPUTS

DC Output

Continuous voltage:	63Vdc
Continuous current:	7.0Adc
10 second Forcing Voltage:	135Vdc (with nominal input applied)
10 second Forcing Current:	15.0Adc
Minimum Field Resistance:	9 Ohms

Alarm Contact Output

Dry Contact Rated:	120/240Vac - make 30A for 0.2S, carry 7A continuously, break 0.1A inductive

REGULATION ACCURACY

Regulation accuracy:	±0.25% no load to full load
Temperature drift:	±0.5% for a 40°C change in one hour
Response time:	<1 cycle to the limit of the A/D converter
THD:	±0.25% for 20% THD and ±0.5% for 40% THD (distortion as seen with a 6 SCR load)

SPECIFICATIONS, continued

AGENCY APPROVALS

UL 508	"Industrial Control Equipment"
CSA C22.2 Number 14	"Industrial Control Equipment"
CE	EMC and LVD

MECHANICAL SPECIFICATIONS

Operating temperature:	-40°C to +70°C
Storage temperature:	-40°C to +80°C
Shock:	20 Gs in three mutually perpendicular planes
Vibration:	5-26Hz, 1.2Gs 27-52Hz, 0.036 inch double amplitude 53-500Hz, 5.0G
Salt Fog:	Per MIL-STD-810E, Method 509.3, 48 hours of testing
Weight:	2.42 lbs. (1.10 kg)
Shipping weight:	2.88 lbs. (1.31 kg)
Dimensions:	5.34" (135.6mm) wide x 10.82" (274.8mm) high x 2.84" (72.1mm) deep

ADJUSTMENTS

Adjustment Ranges

AVR Mode:	100/120, 200/240, 400/480, 600Vac
Fine Voltage Adjustment:	0-15% of nominal in 0.1% steps
Manual (FCR) Mode:	0.7Adc in 0.01Adc steps
VAR Mode:	-100 lead VAR to +100 lag VAR in 0.1% steps
PF Mode:	-0.6PF lead to +0.6PF lag in 0.001PF steps
OEL:	Instantaneous limit: 15A in 0.001Adc steps Time Delay to shutdown: 0-10 seconds in integer steps
Volts per Hertz:	Slope, 0-3V/Hz in 0.1V/Hz increments (See Figure 1) UF kneepoint, 40-65Hz in 0.1Hz increments
Parallel Droop:	0-10% in 0.01% increments
Softstart:	Generator Bias (beginning generator voltage) Time: 0-7200 seconds in 1 second steps
Voltage Matching Speed:	0-300 seconds in 0.01 second steps

Adjustment Methods

- Contact inputs (one for raise and one for lower)
- Auxiliary input ±1Vdc
- PC via BESTCOMS
- PDA via BESTCOMS

FEATURES/FUNCTIONS

PWM Power Stage
A 7.0Adc power stage provides fast response and great immunity to noise and sinewave distortion created by non-linear loads and makes the DECS-100 tolerant to many applications previously considered uncontrollable.

Sensing Input
The sensing input takes nominal voltage up to 600Vac without requiring expensive potential transformers. The adjustment range is capable of being controlled in 0.1Vac steps. This means that circulating current on paralleled generations, due to overly coarse adjustment steps, is no longer an issue.

Stability
20 standard stability ranges are provided, as well as one customizable stability range for customized performance. The PC BESTCOMS software provides PID selection software and a sophisticated response time program to facilitate verification of stability performance.

Front Panel Annunciation
The DECS-100 provides seven LEDs to indicate generator system and DECS-100 conditions without requiring connection to the communications device.

Protection
Four protection functions have the ability to be user-programmed to shut down the DECS-100 and close the alarm contact. They are:

- Generator Overvoltage
- Loss of Generator Voltage*
- Overexcitation Voltage
- Overexcitation Limiting

* Loss of sensing transfer is also selectable by the user in lieu of shutdown due to Loss of Sensing.

Overexcitation Limiting
This feature limits the output current of the DECS-100 to predetermined levels that are safe for the exciter/generator. There are adjustments for current threshold and time delay to customize the performance of the DECS-100 to meet the system's needs.

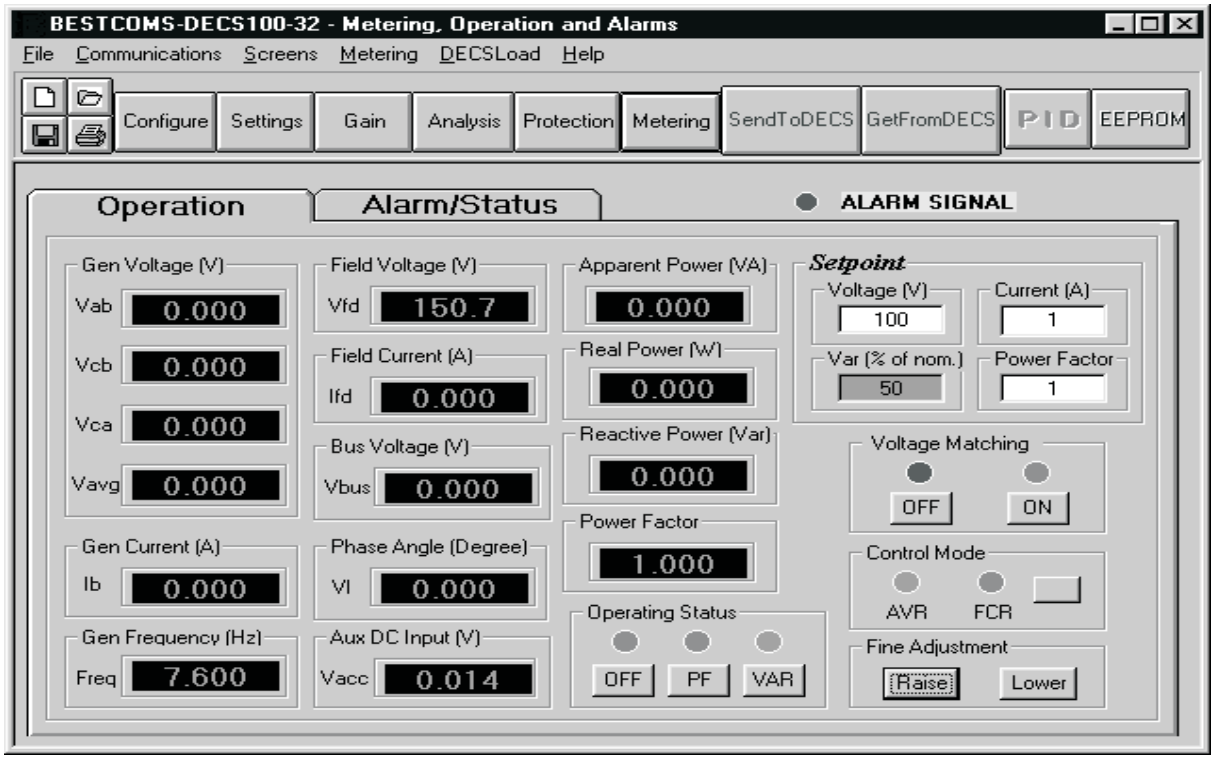
Voltage Matching
This function allows the DECS-100 to match the generator voltage. This feature replaces the same function in the automatic synchronizer, thereby saving money by allowing the use of a less expensive synchronizing device.

Softstart
Softstart functions as a voltage limiter during generator build-up. It limits the generator voltage overshoot typically present when machines are initially started.

VAR/PF Control
Integrated VAR/PF controls save the user the cost of purchasing and installing remote devices that perform the same functions. This function is typically used on utility-paralleled generators that cannot control the grid voltage. Once set, the VAR or PF of the generator output will be regulated.

External Adjustments
The DECS-100 allows for multiple points and methods of external adjustment of the active regulation mode. There are four methods for adjustment: contact input, auxiliary voltage input, PC adjustment, or PDA device operating on Palm OS® 3.3 or newer. The PC and Palm OS® 3 communications also can change operating modes and set points.

Communications
PC (Windows® 95, 98, NT, Me compatible) and PDA (or equivalent device using Palm OS® 3.3 or newer) communications software is provided by Basler Electric with the DECS-100. The PC BESTCOMS allows for total setup, control, and monitoring of all parameters of the DECS-100. The PC BESTCOMS allows for custom PID selection and has a monitoring screen for viewing all of the generator parameters in actual machine levels. The Palm OS® 3 BESTCOMS allows for most of the PC-based features while using a low cost communications tool. Both methods use the RS-232 DB9 connector located on the DECS-100. Both software packages are provided with every DECS-100 on a single CD-ROM along with the instruction manual and product bulletin.



Typical BESTCOMS PC Software Screen

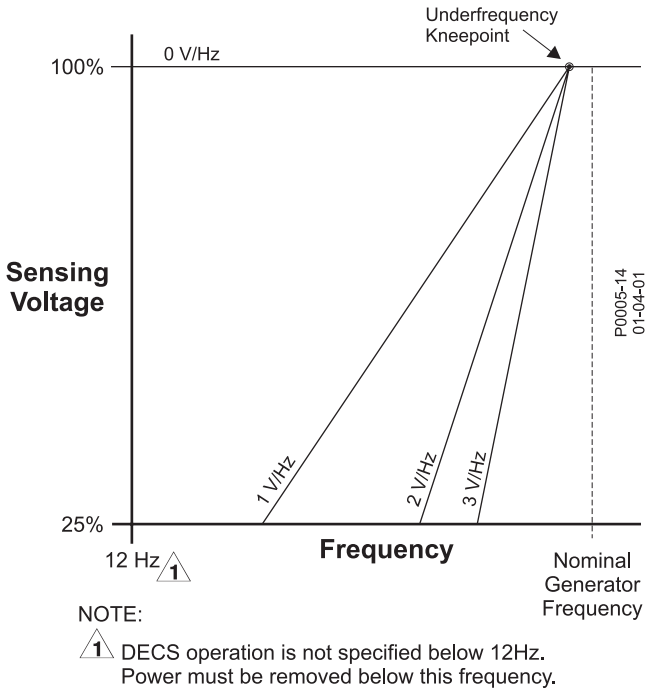


Figure 1 - Typical Volts per Hertz Curve

CONNECTIONS

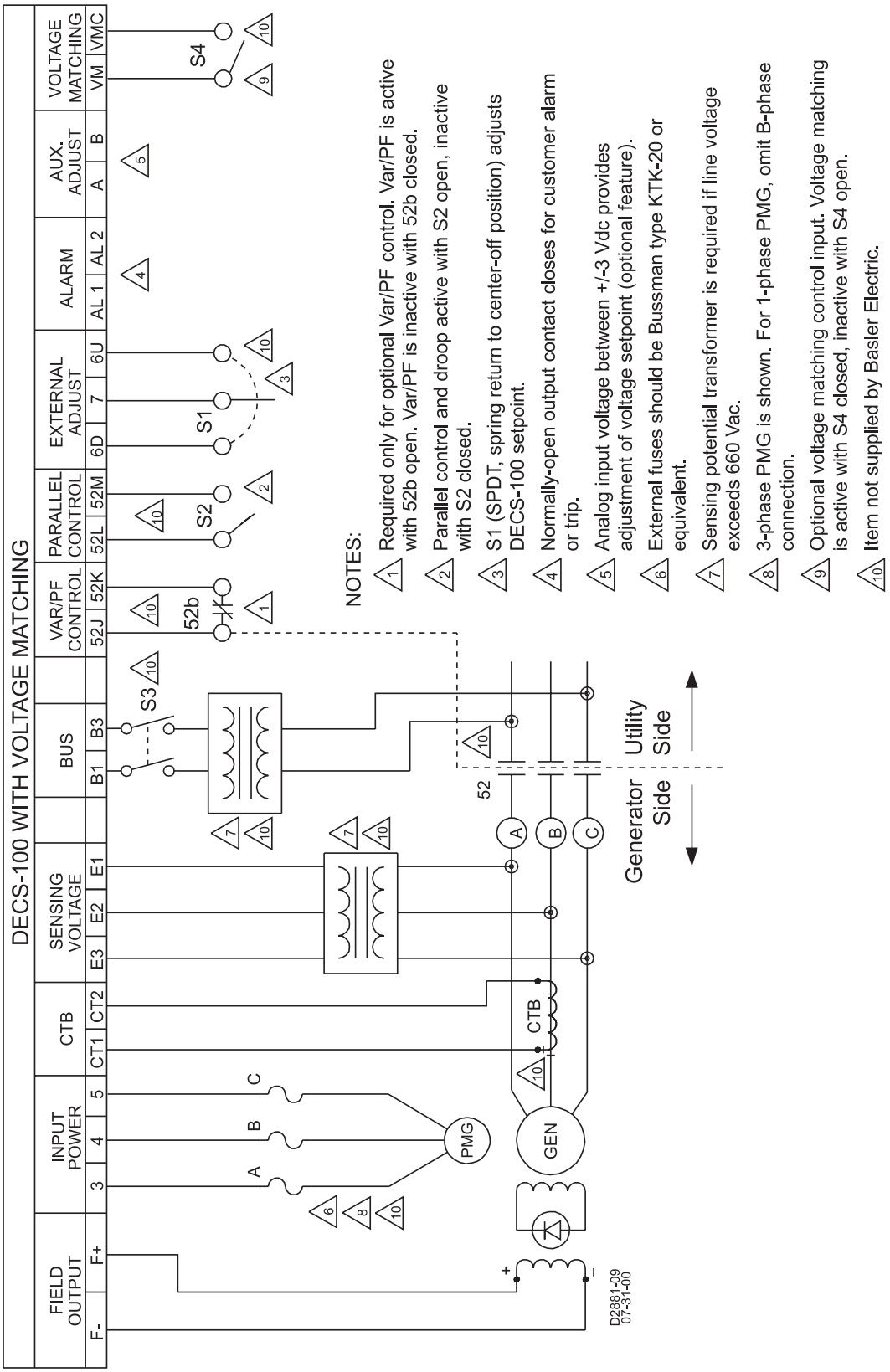


Figure 2 - Typical Connections for PMG Application with ABC Rotation and Three-Phase Sensing

DIMENSIONS

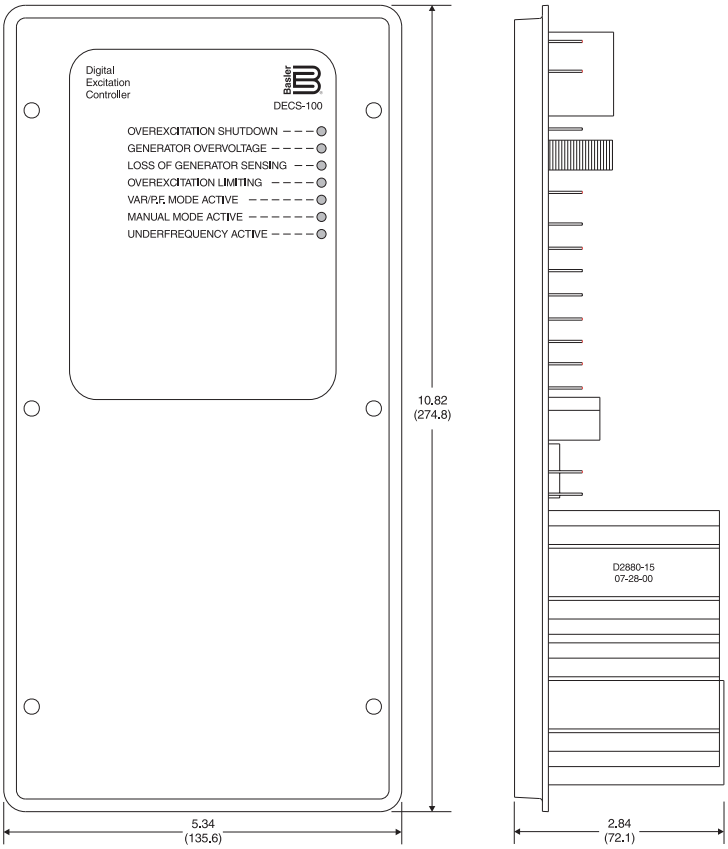


Figure 3 - DECS-100 Dimensions

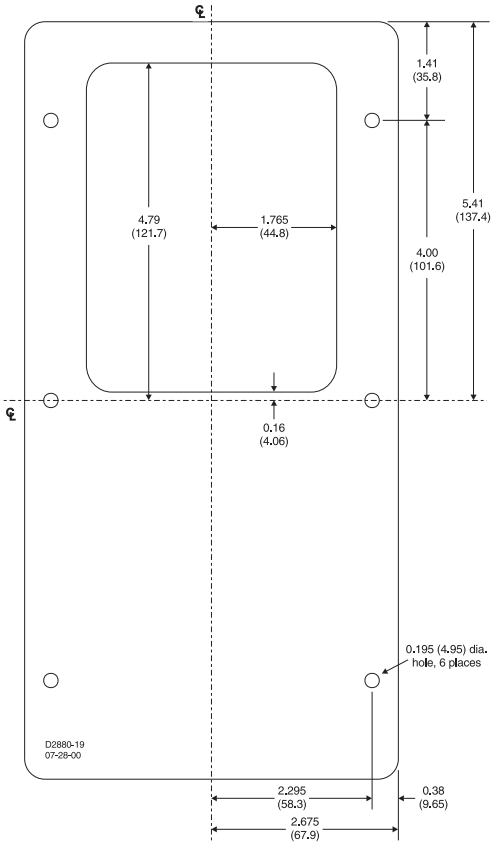
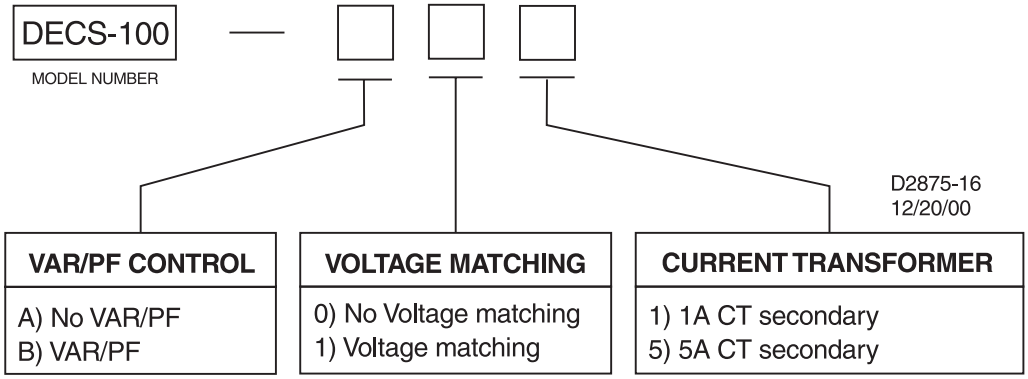


Figure 4 - Cutout and Drilling Dimensions

HOW TO ORDER

The DECS-100 is selected by the style chart below. For example, if a DECS-100 is required with VAR/PF control, voltage matching, and a 5 Amp CT, the complete model number would be DECS-100-B15.



Additional information:

- The DECS-100 is available in bulk-packaged shipments of 50 pieces. If this is desired, please inform your customer service representative.
- The DECS-100 is shipped with a CD-ROM that contains the Instruction Manual, Product Bulletin, BESTCOMS for PC Windows® NT 3.51 or later, 95, 98, or Me and BESTCOMS for Palm OS® 3.3 or newer users. Printed manuals and bulletins are available at an additional cost.

ACCESSORIES

DECS-100 is designed to operate with the following accessories. For additional product compatibility, please contact your application specialist at Basler Electric or your sales representative.

- MVC300 Manual Voltage Controller
- EDM200 Exciter Diode Monitor
- EL200 Min/Max Excitation Limiter
- SCP250 VAR/PF controller

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